The Effect Of Accounting Regime Characteristics On The Prediction Of Future Cash Flows: An International Comparison

Joan Hollister, State University of New York at New Paltz
Victoria Shoaf, St. John's University
Gregory Tully, Marist College

ABSTRACT

For nine countries, we show that the components of accrual accounting earnings provide information incremental to that of current cash flows from operations in explaining next year's cash flows from operations. We relate the usefulness of accounting earnings components for explaining near-term cash flows to certain country characteristics—common/code-law jurisdiction, accrual index, shareholders' rights, and uncertainty avoidance. We provide evidence that accounting accruals generated by shorter horizon, code-law regimes provide more incremental explanatory power for short-term predictions than those of longer horizon, common-law countries.

INTRODUCTION

This paper investigates the international variation of an important property of accounting income: its ability to predict near-term cash flows. We compare the extent to which information provided by accounting accruals under accounting regimes with different characteristics improves the ability to predict these future operating cash flows, particularly next period's operating cash flows.

Both the Financial Accounting Standards Board (FASB) and the International Accounting Standards Board (IASB) hold the view that accounting earnings (i.e., operating cash flows and accounting accruals) are more predictive of future cash flows than current cash flows alone (FASB 1978; IASB 2000). Prior research, using stock prices (returns) to proxy for the present value (change in value) of all future cash flows, supports this position by demonstrating the value relevance of accounting earnings in different international contexts (Alford et al. 1993; Ali and Hwang 2000; Ball et al. 2000; Hung 2001). Still, Ball et al. (2000) recommend that research addressing the effects of international diversity in accounting regimes focus on the important properties of reported income.

While this prior research provides the foundation for our study, a fundamental difference is that we do not use a market valuation approach. We examine international diversity in the accrual process itself and the relative usefulness of disaggregated accruals of different countries for the prediction of one year ahead cash flows, using the model developed by Barth et al. (2001), based on the work of Dechow et al. (1998). We focus on next period's reported cash flows to study the accrual process because it is a direct measure, reflecting the accounting and reporting system in each regime, and thus less susceptible to the influence of cultural, political, and environmental variations across countries than indirect, external measures like stock prices. Further, predicting next period's cash flows is an important quality of accrual accounting in the bank-based countries that we study (e.g., Ballwieser 2001), and it is becoming increasingly important in market-based economies (DeFond and Hung 2002). The prediction of near-term cash flows is relevant to the assessment of bankruptcy or insolvency risk, and operating cash flows are a traditional measure in the assessment of such risk (Beaver 1966; Ohlson 1980).

Specifically, we investigate the international variation in the ability of the components of accounting earnings to predict the following year's cash flow from operating activities for nine industrial countries. We

demonstrate that while disaggregated accruals add significant explanatory power to current period cash flows in predicting next period's cash flows in all cases, they do so to varying degrees, depending on the extent to which accruals are required by the accounting regime and on the common or code-law heritage of the country's legal system. Consistent with our hypotheses, we find that for predicting next period's cash flows, accruals from code-law regimes provide more explanatory power than those from regimes based in common-law jurisdictions and that it is the non-current accruals that drive this result. Further, we find that this type of incremental informativeness of accruals varies *inversely* with the level of accruals required by an accounting regime.

We also relate the observed international variation in cash flow predictive ability to two other factors: the degree of shareholder protection provided by law and a country's level of uncertainty avoidance, a fundamental cultural dimension described by Hofstede (1980). For these factors, our expectation of a relationship is based on their strong association with both the common/code-law dichotomy and the degree of required accruals. Though not the subject of formal, *ex ante* hypotheses, we find that these characteristics are also strongly associated with the differences in the informativeness of disaggregated accruals across accounting regimes. The incremental informativeness of disaggregated accruals varies inversely with the level of shareholder protection, and directly with the level of uncertainty avoidance.

In tests run to further investigate our results, we find that the effects of accounting accruals on cash flows two and three years in the future support our theory that the more accruals relate to expected cash flows in future periods, the less incremental explanatory power they provide for the prediction of near-term cash flows. We find that accounting accruals in the code-law countries provide less significant incremental explanatory power when the horizon is extended to two years. In the third year, they are not significantly different from the incremental information provided by accounting accruals from common-law regimes. Thus, accounting accruals in code-law countries provide incremental explanatory power for predicting near-term cash flows, but not more distant ones.

Research investigating the effects of international variation in the application of accrual accounting principles is interesting and important for at least two reasons. First, it facilitates study of the generality of accrual accounting properties–that is, whether research findings based on accounting data generated in one accrual regime also characterize accrual systems generally or, alternatively, whether the findings result from a unique interaction among the regime's specific accrual principles and that jurisdiction's specific institutional and cultural structures and practices. Secondly, the process of globalization has increased the incentives to reduce the variation in accrual principles across countries. In fact, convergence has been moving toward an accounting model closer to that shared by common-law accounting regimes. It is important to understand that increasing convergence toward a higher level of accruals may result in financial reporting that provides less accessible information for some purposes, such as predicting next year's cash flows.

The remainder of this paper proceeds as follows. The second section discusses the motivation for the study, provides essential background, and develops the testable hypotheses. The third section describes the sample selection, and the fourth presents our tests and statistical results. In the fifth section, we examine particular findings and their implications, and we review further tests that we performed. We conclude with an overall discussion of the results.

BACKGROUND AND HYPOTHESIS DEVELOPMENT

The FASB has long advocated the use of accrual accounting as a superior measure of firm performance. The FASB's Statement of Financial Accounting Concepts No. 1 states that "interest in an enterprise's future cash flows and its ability to generate favorable cash flows leads primarily to an interest in information about its earnings rather than information directly about its cash flows" (¶43). That is, earnings, which include accruals, provide more information about future cash flows than do current cash flows alone. Underlying the FASB's position is a traditional valuation model, where firm value is the present value of the firm's future cash flows. In an efficient stock market, the firm's stock prices impound the present value of all expected future cash flows, so in many research studies stock prices (or returns or other transformations) are used as the measure of value, and variables are deemed value relevant to the extent that they affect market prices (see Francis and Schipper 1999). Although recent

research has found a deterioration in the association between stock returns and earnings in the US (Kim and Kross 2002; Brown et al. 1999; Collins et al. 1997), prior research supports the FASB's assertion about earnings by demonstrating that reported earnings are indeed stronger determinants of stock prices than are reported current cash flows (Ball and Brown 1968; Dechow 1994; Bartov, Goldberg, and Kim 2001), but that accruals and cash flows are incrementally value relevant (Rayburn 1986; Wilson 1987; Ali 1994; Pfeiffer et al. 1998).

Having established the importance of earnings (cash flows and accruals) in predicting future cash flows, researchers have investigated the nature of the accrual process and the information conveyed by accruals. Dechow et al. (1998) show how working capital accruals (i.e., changes in receivables, inventory, accounts payable) shift operating cash flows to different years, and they model the process by which expected cash flows are incorporated into earnings. They preclude potentially problematic valuation metrics by modeling the accrual process as it directly affects realization in the next and subsequent periods' cash flows. Barth et al. (2001) build on the Dechow et al. model of the accrual process by focusing on the role played by each of the components of earnings and accruals and their temporal relationships. Barth et al. show that modifying their basic model, which uses next period's cash flows as the dependent variable, by increasing the years of cash flows affected by the accruals, or by showing the effect of a number of previous years' accruals on current cash flows, does not change their findings about the accrual process. Both Dechow et al. and Barth et al. use data exclusively from US sources, so they model the accrual process for the US.

The International Accounting Standards Board (IASB) has also endorsed accrual accounting. In its *Framework for the Preparation and Presentation of Financial Statements*, the IASB states that accrual-based financial statements "provide the type of information about past transactions and other events that is most useful to users in making economic decisions." However, accounting regimes vary in the degree to which they require accrual recognition of future cash flows. Prior research has documented some of the differences in accrual systems and jurisdictions, and has related them to the property of value relevance as reflected in the association between accounting earnings and stock returns (Alford et al. 1993; Ali and Hwang 2000; Ball et al. 2000; Hung 2001). The factors of diversity examined include the degree to which accruals are required by an accounting regime (Hung 2001), the degree of shareholder protection provided by law (Hung 2001; LaPorta et al. 2000), the congruence between financial and tax accounting systems (Alford et al. 1993; Ali and Hwang 2000; Hung 2001), and common or code-law heritage of the legal system in which an accounting regime is embedded (Ball et al. 2000; Hung 2001). Nonetheless, there is little or no evidence pertaining to international differences in the accrual process itself or in the relative usefulness of disaggregated accruals in the prediction of future cash flows.

We seek to contribute to the understanding of the effects of international diversity by investigating how international variations in the characteristics of accounting regimes affect the relative usefulness of accrual accounting components for the prediction of next period's cash flows. To do this, we build on the model developed by Barth et al. for several reasons. Their basic model, which poses disaggregated accruals as the determinants of next period's cash flows, permits us to use firm-reported financial information to assess the impact of accruals and to avoid comparing different market-generated measures in a valuation model. Market prices and returns may not be associated with firm value in other countries in the same way that they are in the US, and bank-based economies may prefer measures of liquidity or solvency. Ballwieser (2001) says of German accounting, for instance: "The strong influence of the prudence principle looks to the interests of creditors by minimizing profits rather than making good information available" (p. 1223). Moreover, DeFond and Hung (2002) have documented the increasing demand for cash flow forecasts by market participants in the US, especially for firms with large accruals, more heterogeneous accounting choices, high earnings volatility, high capital intensity, and poor financial health.

To characterize international variation in accounting regimes, we focus primarily on two characteristics as explanatory variables: the common-law or code-law heritage of the legal system in which the accounting regime is embedded and the degree to which the accounting regime requires accruals. There have been numerous systems for categorizing and grouping countries for analysis over the years. In one of the first comparative accounting systems, the American Accounting Association (1977) classifies accounting in code-law countries as having features consistent with a "macroeconomic" basis. That is, their accounting standards are formulated according to national economic policy objectives, and their reporting is intended to serve the needs of multiple stakeholders. Mueller

(1967), in his seminal work, characterizes code-law countries as following a "uniform approach," in which accounting is standardized and used as a tool for administrative control by the government. Reflecting the code-law heritage of their legal systems, in these countries compliance with legislated accounting regulations is considered more important than whether the resulting information in the financial statements conveys a realistic representation of an entity's financial position or results of operations. Accounting regimes in common-law countries are more representative of the "microeconomic" end of the micro-macro continuum because emphasis is placed on reporting for investment decisions. In these countries, financial statements have been the primary source of financial information for stockholders, and accounting standards have evolved over time with a mission of fulfilling this need. Mueller classifies these countries as using an "independent discipline approach," whereby accounting standards develop as part of ongoing business practices, not from acts of legislative bodies. Mueller's system is still cited in international texts (e.g., Choi et al. 2002) and provides a foundation for classification of countries by significant attributes. More recently, the work of La Porta et al. (1997) demonstrates the effect of countries' legal systems on corporate financing. Leuz et al. (2002), for instance, designate clusters of countries based on investor protection laws and enforcement. Both Ball et al. (2000) and Fulkerson et al. (2002) review these and other elements of international diversity and conclude that the common/code-law classification scheme parsimoniously captures the international differences in forces likely to influence the adoption and implementation of accrual principles and practices.

The basis for our hypotheses about the effect of the differences between common and code-law jurisdictions is provided by Ball et al. (2000), who contrast the timeliness and conservatism of the accounting incomes generated by common versus code law accounting regimes. Ball et al. define the timeliness of an accounting regime as the rate at which its accounting income impounds economic income (defined as changes in market value). A central finding of the Ball et al. study is that economic income is impounded more quickly, or earlier, in the accounting incomes generated by common-law-based accounting regimes than it is in that of code-law-based regimes. Theoretically, economic income (change in market value) reflects changes in expectations of the time series distribution of future cash flows for the entity. To say that one accrual regime impounds economic income earlier than another means that it incorporates more distant expected cash flows into earnings currently through accruals, implying that the time horizon underlying the accruals of the timelier regime is longer than that of the one that is less timely.

These differing accrual horizons have interesting implications concerning the relative informativeness of accruals for near-term predictions such as the prediction of next period's cash flows from operations. Ignoring the degenerate zero horizon or cash basis regime, all accrual regimes have a horizon of at least one period, so will impound information about next period's cash flows. However, the greater the extent that accruals provide information about cash flows arriving *after* the next period, the more they will confound the information pertaining to the next period's cash flows. Because the accruals of the more timely regimes impound information about changes in future cash flows for more future periods (beyond the first) than the accruals of less timely regimes, the accruals of the *less* timely regimes will be more predictive of near-term future cash flows than those of the *more* timely regimes. Thus, we expect that the accruals of the less timely regimes will provide more incremental information about next period's cash flows than those of the more timely regimes. Based on Ball et al.'s finding pertaining to the relative timeliness of common and code-law accounting regimes, our first hypothesis (in the alternative form) is:

H_{1a}: Adding disaggregated accruals to cash flows provides more incremental explanatory power for predicting next year's net operating cash flows in code-law accounting regimes than in common-law regimes.

A more precise test of our argument can be constructed by focusing on accruals related to non-current assets or liabilities. We expect little difference in the predictions of working capital or "current" accruals from one accounting regime to the next because they are all expected to impact next year's cash flows. Rather, we expect that variations in regimes' timeliness will affect the information in non-current accruals specifically. Hence, we narrow the previous hypothesis to state this expectation (in the alternative form):

H_{1b}: Adding disaggregated accruals pertaining to *non-current* assets or liabilities to cash flows and current accruals provides more incremental explanatory power for predicting next year's net operating cash flows in code-law accounting regimes than in common-law regimes.

The accrual index used by Hung (2001), which is based on the accrual characteristics of accounting standards, provides a finer approach than the dichotomous partitioning of accounting regimes into code and common law based. Using this finer partition, we can examine the effects of international variations in regime characteristics on predictive ability with greater sensitivity. Hung assigns each country a number based on the degree to which some accruals are required in its national accounting standards. This accrual index is computed by weighting the extent to which eleven accrual-related standards are adopted by an accounting regime. The index is constructed so that the greater the extent to which an accounting regime adopts these standards, the higher its accrual index. Each of the standards on which the index is based is "… directly related to the timing differences between cash receipt/disbursement and revenue/expense recognition" (Hung 2001, p. 405). Moreover, each of the standards requires the accrual (deferral) of cash flows occurring a number of periods in the future (past), and is therefore directly related to non-current assets or liabilities. Thus, the higher a regime's accrual index, the more that regime's accrual changes will contain information unrelated to next period's cash flows. While such information may be value relevant, it may confound the accrual information pertaining directly to next period's cash flows. Consequently, we hypothesize that an accounting regime's accrual index score is inversely related to the incremental contribution of that regime's accrual information for the prediction of next period's cash flows. The next hypothesis states this expectation (in alternative form):

H_{2a}: The incremental explanatory power for predicting next year's operating cash flows provided by adding disaggregated accruals to cash flows is inversely related to the accrual index of the accounting regime.

Because the accrual index is based on standards related to non-current assets and liabilities, differences in informativeness due to variations in regimes' accrual indices should affect accruals pertaining to more than one future period. We again emphasize this expectation in the next hypothesis (in the alternative form):

H_{2b}: The incremental explanatory power for predicting next year's operating cash flows provided by adding disaggregated accruals pertaining to *non-current* assets or liabilities to cash flows and current accruals is inversely related to the accrual index of the accounting regime.

We examine two additional characteristics that might be influential in affecting an accounting regime's principles and practices: shareholder protection and uncertainty avoidance. For shareholder protection, we rely on the measures provided by La Porta et al. (1997) of shareholders' ability to exercise various rights. La Porta rated countries on a 0-5 scale depending on shareholders' ability to vote, control shareholders' meetings, elect directors, and make legal claims. Hung (2001) notes that countries with strong shareholder rights have more liquid capital markets and more public information production and also observes that they closely correlate to the common/code-law attribute. Nonetheless, because of the importance of the work of La Porta et al. to explaining regional financing differences, we examine their criteria separately.

Finally, we include a characteristic described by Hofstede (1980) as one of the fundamental cultural dimensions that may be used to differentiate societies, that of uncertainty avoidance. Uncertainty avoidance refers to the level of anxiety felt by members of a society when facing unstructured or ambiguous situations. We investigate whether this cultural attribute is associated with the predictive ability of accounting accruals, since it is a behavioral measure related to the extent to which cultures are comfortable with risk-related activities. Theoretically, this aspect of culture could play a role as part of the environment in which each country's national accounting standards evolved and/or as part of how accounting is practiced. We note that uncertainty avoidance is greater in our code-law sample countries than in our common-law sample countries. Consistent with this association, Ball et al. (2000, p. 3) observe: "… the demand for accounting income under code law is influenced more by the payout preferences of agents for labor, capital and government, and less by the demand for public disclosure. … We hypothesize that their preferences penalize volatility in payouts and thus in income." Thus, the greater uncertainty avoidance of code-law regimes may underlie the tendency of these regimes to avert estimating uncertain future

assets and liabilities, thereby resulting in less timely incorporation of economic income in the current year's accruals.

SAMPLE SELECTION AND DESCRIPTION

We focus our investigation on nine industrialized countries with well-developed accounting systems. Four of these countries are classified as having common-law legal systems: Australia, Canada, the United Kingdom, and the United States. The remaining five countries have code-law systems: France, Germany, Japan, the Netherlands, and Switzerland. Together these countries account for the vast majority of the world's market capitalization.

To test the effects of country characteristics on the predictive ability of accruals, we obtained the rankings of each of our sample countries' accrual indices from Hung (2001), the relative ranking of their shareholder protection from La Porta (1997), and their scores on uncertainty avoidance from Hofstede (1980). The list of the nine countries, their common law/code-law heritage and their assigned scores on these three ordered characteristics are shown in Table 1.

The financial data was obtained from the Global Researcher CD Worldscope database, dated November 2001. Since prior to 1994 few companies from code-law countries reported cash flows from operating activities, we selected our sample from the years 1994 through 2000. We accessed values for reported net income, depreciation and amortization expense, cash flows from operations, current assets, cash and short-term investments, receivables, inventory, current liabilities, accounts payable, dividends payable and short-term debt, directly from the database. Current (working capital) accruals were computed as the annual changes in receivables, accounts payable, and inventory; the other current accruals component was calculated as the annual change in other current net operating assets, which is other current operating assets (current assets less cash and short-term investments, receivables, and inventories) less other current operating liabilities (current liabilities less accounts payable, short-term debt and the current portion of long-term debt). The long-term portion of other accruals was calculated by subtracting operating cash flows, depreciation and amortization expense, and the previously determined current accrual components from net income. We used net income, rather than income before extraordinary items, to adhere to the clean surplus concept described by Ball et al. (2000) and to maintain consistency, because of the variation in classifications among countries. The data was accessed in the countries' native currencies to avoid any currency translation issues. All variables were scaled by average total assets.

We included all firm-years for which there was complete data, except those for firms classified as financial services institutions (i.e., those having primary SIC codes in the 6000s). For each country, the top and bottom 1% of the scaled net income and the cash flow from operating activities variables were eliminated from the data sets to avoid obtaining results driven by outliers. These procedures yielded 34,069 usable firm-year observations, 29,579 observations (87%) from four common-law countries and 4,490 observations (13%) from five code-law countries.

Table 1: Characteristics by Country

Country # of Observations	Code Law = 0 Common Law = 1	Accrual Index	Shareholder Rights Index	Uncertainty Avoidance
Switzerland n = 574	0	.32	1	58
Germany n = 1,060	0	.41	1	65
Japan n = 1,481	0	.55	3	92
France n = 765	0	.64	2	86
Netherlands n = 610	0	.75	3	53
Australia n = 902	1	.82	4	51
Canada n = 1,791	1	.82	4	48
United Kingdom n = 4,540	1	.82	4	35
United States n = 22,346	1	.85	5	46

The **Accrual Index** (Hung 2001) increases with the extent accounting standards require accruals or deferrals.
The **Shareholder Rights Index** (LaPorta 1997) increases with the extent a legal system protects investors.
The **Uncertainty Avoidance** metric (Hofstede 1980) is higher for cultures that have less tolerance for a lack of structure or ambiguity (and lower for those that have more tolerance for a lack of structure or ambiguity).

TESTS AND RESULTS

In order to compare the informativeness of cash flows and accruals from various accounting regimes based on country-specific characteristics, we use a two-stage methodology. The purpose of the first stage is to establish that the disaggregated accruals are, indeed, incrementally informative on a country-by-country basis. In this stage, we follow Barth et al. (2001) by regressing operating cash flows on the previous period's operating cash flows and then on the previous period's disaggregated earnings—i.e., operating cash flows and the accrual components of earnings. We establish measures of the near-term cash flow predictive ability for the accounting systems of each of the nine countries by finding the explanatory power of the regression models. We then determine the incremental explanatory power from adding the disaggregated accrual components of earnings to current operating cash flows. Having established that the accruals contain significant information for each individual country, in the second stage we evaluate the differences between the results of these regressions comparatively across accounting regimes and in relevant country groups. It is in this second stage that we address our hypotheses.

The First Stage: Testing Cash Flow Prediction Models

The benchmark regression model regresses each year's cash flows on the previous year's cash flows.

[1] $$CF_{it} = \alpha_0 + \alpha_1 CF_{i,t-1} + e_{it}$$

$CF_{i,t}$ is the cash flow from operating activities for year t and $CF_{i,t-1}$ is the previous year's cash flow from operating activities, both deflated by average total assets to eliminate any effects of firm size. The explanatory value of this first model is the proportion of the variation in the next year's operating cash flows that can be explained solely by the current year's cash flow component of earnings, which is the model's R^2. As mentioned, this model's R^2 provides a benchmark against which we compare the models that include the accrual components of earnings.

The full model, which includes seven components of earnings as independent variables, is as follows:

[2] $CF_{it} = \beta_0 + \beta_1 CF_{i,t-1} + \beta_2 \Delta AR_{i,t-1} + \beta_3 \Delta AP_{i,t-1} + \beta_4 \Delta INV_{i,t-1} + \beta_5 CURO_{i,t-1} + \beta_6 DEPR_{i,t-1} + \beta_6 LTO_{i,t-1} + \varepsilon_{it}$

In this model, cash flow from operating activities (*CF*) in year *t* depends on the cash flow from operating activities (*CF*) in year *t-1*, as well as the change in receivables (Δ*AR*), the change in accounts payable (Δ*AP*), the change in inventory (Δ*INV*), the other current (working capital) accruals (*CURO*), the depreciation and amortization expense (*DEPR*), and all other long-term accruals (*LTO*), all for year *t-1*. The *LTO* variable is the residual when the cash flow from operating activities and all of the other identified accruals are removed from reported net income. As with the previous model, all of the variables are deflated by average total assets.

Table 2: Comparison of Cash Flow Prediction Model Performance by Country*

CASH Model: $CF_{it} = \alpha_0 + \alpha_1 CF_{i,t-1} + e_{it}$

FULL Model: $CF_{it} = \beta_0 + \beta_1 CF_{i,t-1} + \beta_2 \Delta AR_{i,t-1} + \beta_3 \Delta AP_{i,t-1} + \beta_4 \Delta INV_{i,t-1} + \beta_5 CURO_{i,t-1} + \beta_6 DEPR_{i,t-1} + \beta_7 LTO_{i,t-1} + \varepsilon_{it}$

CURR Model: $CF_{it} = \gamma_0 + \gamma_1 CF_{i,t-1} + \gamma_2 \Delta AR_{i,t-1} + \gamma_3 \Delta AP_{i,t-1} + \gamma_4 \Delta INV_{i,t-1} + \gamma_5 CURO_{i,t-1} + \upsilon_{it}$

Country	R^2 [CASH]	R^2 [FULL]	R^2 [CURR]	Incremental Contribution of All Accruals R^2 Increase: R^2[FULL] - R^2[CASH]	Incremental Contribution of Noncurrent Accruals R^2 Increase: R^2[FULL] - R^2[CURRENT]
Switzerland n = 574	.174	.283	.234	.109	.049
Germany n = 1,060	.167	.254	.193	.087	.061
Japan n = 1,481	.212	.402	.313	.190	.089
France n = 765	.196	.284	.246	.088	.038
Netherlands n = 610	.119	.194	.163	.075	.030
Australia n = 902	.395	.422	.405	.027	.017
Canada n = 1,791	.352	.428	.407	.076	.022
UK n = 4,540	.356	.419	.389	.063	.030
US n = 22,346	.524	.560	.542	.036	.017

* All R^2's and changes in R^2 are significant $p < 0.000$, using the F-test.

The explanatory value of the full model is the proportion of variation in a period's operating cash flows that can be explained by the seven components of the previous year's net income. The R^2 results for this set of tests are shown in Table 2 in the columns labeled CASH, for the benchmark model, and FULL, for the full model. (For seven of the countries the coefficients for all of the independent variables in these two models were statistically significant at the .01 level. For France the coefficient for DEPR was not significant and for Australia ΔAP, ΔINV and LTO were not significant.) The fifth column in Table 2 presents the differences in the R^2 statistics of these two models. To test the significance of these differences, we use the F-test for the comparison of nested models. The increase in explanatory power of the full model versus the benchmark model is significant ($p<0.001$) for each of the nine countries in the sample. Therefore, for each of the nine countries, the accrual components add significant cash flow predictive value, regardless of the accounting regime. These results indicate that accrual-based earnings, reported in components as advocated by the FASB and the IASB, provide more information about future cash flows

than do cash flows alone, regardless of the accounting policies of the particular country. In other words, including information about individual accruals yields a significantly better prediction of next period's cash flow than is obtained by using cash flow from operating activities alone. These results extend those of Barth et al. (2001) to eight additional accounting regimes, and they provide the unequivocal support required to conduct the comparative evaluations in the second stage of investigation.

The Second Stage: Comparing The Cash Flow Prediction Power Across Accounting Regimes

In the second stage, we are able to use the statistical data for individual countries provided by the first stage regressions to investigate whether and how the explanatory power of operating cash flows and accruals from our sample of accounting regimes differ, and how these differences are explained by country-specific characteristics. To substantiate hypothesis H_{1a}, our objective is to show that the accrual components of earnings for code-law countries add more explanatory power for next year's cash flows than do the accrual components of earnings for common-law countries. To this end, we use the nonparametric Mann-Whitney U test (Lehmann 1975). We use this test for two reasons. First, it is a nonparametric test, so it is appropriate for these data because the distribution of sample R^2s is non-normal. Second, because the Mann-Whitney U test is based on the ranks of the individual country R^2 differences, it is not unduly influenced by the increase in predictive ability for any one accounting regime. To use the Mann-Whitney U test, the improvements in explanatory power due to the accruals of each regime (i.e., the differences in the R^2 of the full model versus the benchmark model) are ranked. These ranks are then grouped and averaged for the common-law countries and for the code-law countries. As reported in Table 3, Panel A, the mean of the ranks of the code-law countries is higher than that of the common-law countries. This difference in the mean ranks is significant ($p<0.032$), which demonstrates that the incremental contribution of the accrual components is significantly greater in the code-law countries than in the common-law countries.

To test hypothesis H_{1b} we introduce a third model, which includes only the more current accrual components (changes in receivables, changes in accounts payable, changes in inventory, and the current portion of other accruals) along with the operating cash flow component of earnings as independent variables.

$$[3] \qquad CF_{it} = \gamma_0 + \gamma_1 CF_{i,t-1} + \gamma_2 \Delta AR_{i,t-1} + \gamma_3 \Delta AP_{i,t-1} + \gamma_4 \Delta INV_{i,t-1} + \beta_5 CURO_{i,t-1} + \upsilon_{it}$$

This model is similar to the full model, but it does not include depreciation expense or other long-term accruals, both of which include accruals that are primarily long term in nature. This model will be referred to as the current components model. The differences in the R^2 statistics for the current components model versus the full model isolate the incremental explanatory power of the depreciation expense and other long-term accruals components. This information is reported in the last column of Table 2. As with the previous hypothesis, the Mann-Whitney U test is used to test hypothesis H_{1b}. The incremental explanatory power of depreciation expense and other long-term accruals is larger for the code-law countries than it is for the common-law countries, and the difference between the relative rankings of the two groups is significant ($p<0.032$). The results of the Mann-Whitney U test are shown in the last column of Table 3, Panel A.

Thus, our results support both hypotheses H_{1a} and H_{1b}. We demonstrate that the accrual components of code-law countries contribute more to explaining next year's operating cash flows than do the accrual components of common-law countries. In addition, we provide evidence that the components of earnings that are most likely to incorporate non-current information, depreciation expense and other long-term accruals, add more explanatory power in code-law countries than in common-law countries.

Hypotheses H_{2a} and H_{2b} are concerned with the relationship between the countries' accrual index values and the incremental explanatory power provided by the accruals for next year's operating cash flows. We use Spearman rank order correlations to test both hypotheses because the accrual index is an ordinal measure and to avoid undue influence due to the extraordinary performance of any one particular accounting regime. For hypothesis H_{2a} we calculate the correlation between the accrual indices and the differences in the R^2 statistics of the benchmark and the full models. As reported in the first rows of Table 3, Panel B, this correlation is -0.831, which is significant ($p<0.006$). This negative correlation indicates that the larger the accrual index, the less is contributed by the accruals to explain next year's operating cash flows. To test hypothesis H_{2b}, we calculate the Spearman correlation of the accrual indices and the difference in the R^2 statistics of the current and the full models. This correlation, -0.881, is also significant ($p<0.001$). Thus, both hypotheses H_{2a} and H_{2b} are supported by our results.

The higher the accrual index of an accounting regime, the lower the incremental explanatory power. This finding holds true for both the accrual components in general and for the accrual components with the longer horizons (depreciation expense and long-term other) in particular.

Table 3: Correlations of the Cash Flow Prediction Model Performance and the Country-Specific Characteristics

CASH Model: $CF_{it} = \alpha_0 + \alpha_1 CF_{i,t-1} + e_{it}$

FULL Model: $CF_{it} = \beta_0 + \beta_1 CF_{i,t-1} + \beta_2 \Delta AR_{i,t-1} + \beta_3 \Delta AP_{i,t-1} + \beta_4 \Delta INV_{i,t-1} + \beta_5 CURO_{i,t-1} + \beta_6 DEPR_{i,t-1} + \beta_7 LTO_{i,t-1} + \varepsilon_{it}$

CURR Model: $CF_{it} = \gamma_0 + \gamma_1 CF_{i,t-1} + \gamma_2 \Delta AR_{i,t-1} + \gamma_3 \Delta AP_{i,t-1} + \gamma_4 \Delta INV_{i,t-1} + \gamma_5 CURO_{i,t-1} + \upsilon_{it}$

Panel A: Mann-Whitney U Tests of the R^2 Results for Common/Code Countries

	R^2 [CASH]	R^2 [FULL]	R^2 [CURR]	R^2 Increase: R^2[FULL] - R^2[CASH]	R^2 Increase: R^2[FULL] - R^2[CURR]
Means					
Common Law (n = 4)	.407	.457	.436	.051	.022
Code Law (n = 5)	.174	.283	.230	.109	.053
Mean Rank (ranks 1 to 9)					
Common Law (n = 4)	7.50	7.50	7.50	2.75	2.75
Code Law (n = 5)	3.00	3.00	3.00	6.80	6.80
Mann-Whitney U	.000	.000	.000	1.000	1.000
Exact Sig. (2-tailed)	.016	.016	.016	.032	.032

Panel B: Spearman Correlations between the R^2 Results and the Ordered Measures

Characteristic	R^2 [CASH]	R^2 [FULL]	R^2 [CURR]	R^2 Increase: R^2[FULL] - R^2[CASH]	R^2 Increase: R^2[FULL] - R^2[CURR]
Accrual index	.780	.780	.780	-.831	-.881
(two-tailed p-value)	(.013)	(.013)	(.013)	(.006)	(.001)
Shareholder rights index	.846	.846	.846	-.744	-.804
(two-tailed p-value)	(.004)	(.004)	(.004)	(.022)	(.009)
Uncertainty avoidance	-.600	-.583	-.583	.800	.767
(two-tailed p-value)	(.088)	(.100)	(.100)	(.010)	(.016)

We then use the same approach to determine whether there is a correlation for the two supplementary ordered characteristics, shareholder protection and uncertainty avoidance, and the incremental contribution of all the accruals and of the non-current accruals. These results are also shown in Table 3, Panel B. For the shareholders' rights index, the correlations are both negative, -0.744 for shareholders' rights with the incremental contribution of all the accruals and -0.804 with the incremental contribution of the non-current components. Both of these are significant ($p<0.022$ and $p<0.009$, respectively). The negative correlation indicates that the accruals provide more incremental explanatory power for accounting regimes with weaker shareholders' rights than they do in countries with stronger shareholders' rights.

Both the correlations between the incremental contributions of explaining near-term cash flow and uncertainty avoidance are positive (.800 and .767) and significant ($p<0.010$ and $p<0.016$). These results indicate that accruals have more incremental explanatory power for near-term cash flows in countries where people are uncomfortable with uncertainty or ambiguity than in countries where people have more tolerance for uncertain outcomes.

The results of these tests provide persuasive support for the theory that the longer accounting horizon for accruals made by firms in common-law and high accrual index countries interferes with their usefulness in explaining next-year's cash flows.

ADDITIONAL ANALYSIS

Initially we tested the hypotheses directly by considering the amounts contributed to the explanatory power of a one-year ahead cash flow prediction model of different components of earnings. To further examine our results, we approached the hypotheses from additional angles. In this section, we describe the incremental information provided by current accruals for the prediction of one-year ahead cash flows and by all accruals for the prediction of two-year and three-year ahead cash flows.

Incremental Information Provided By The Current Accruals

The previously reported results support the theory that it is the long-term accruals that drive the difference in explanatory power provided by the accruals of code and common-law countries. The argument can be strengthened by demonstrating that for these two groups of countries, the differences in explanatory power of the third model, which includes only the current accrual components of earnings in addition to the cash flow component, and the benchmark model are not significantly different. The improvements in the R^2 for the current components model over the benchmark model for each of the nine countries were calculated, and the Mann-Whitney U test of the effect of the common/code-law classification on their ranks was conducted. The results of this test are not significant ($p<0.190$). (We do not present these results in tables.) This finding is consistent with hypothesis H_{1b}, which states that the difference in improved explanatory power between code and common-law countries is due to the long-term accruals, and thus it adds to the results reported in the previous section.

Likewise, the correlations between the improvement in explanatory power due to adding the current accruals to cash flows and the three ordered measures—accrual index, shareholder protection, and uncertainty avoidance—do not yield statistically significant results at the conventional 0.05 level. This outcome is consistent with our hypotheses associating the differences in incremental explanatory power with the long-term accruals.

Prediction Of Two And Three-Year Ahead Cash Flows

If a shorter accrual horizon results in reported earnings information that is more useful for the prediction of the following year's cash flow from operating activities than earnings information reported by a regime with a longer accrual horizon, then this difference should begin to diminish and eventually disappear for the prediction of cash flows at some point in the future. We tested whether this occurred for the countries in our study within a two to three year ahead time frame. To do this, we ran the same regression models used in the basic study, but with two-year and three-year ahead cash flows as the dependent variables. In order to obtain the additional future cash flow data for the dependent variables, the sample was limited to four years of data for the independent variables (i.e., three-year observations beginning in years 1994 through 1997). The R^2 results by country for the two-year and three-year ahead tests are in Table 4, Panel A and Panel B. Table 5, Panel A, reports the significance test of these results. At the conventional 0.05 level, the differences in the incremental improvement provided by the disaggregated accrual components of the code-law versus the common-law countries for the prediction of two-year and three-year ahead cash flows are not significant ($p<0.063$ and $p<0.286$, respectively). The incremental contribution of the long term accruals is also not significantly different for either the two-year or the three-year ahead cash flows ($p<0.190$ and $p<0.413$, respectively). These results provide evidence that the difference between the contribution of all the accruals and of the long-term accruals to the explanatory power of the code and common-law regimes' cash flow prediction models is limited to the prediction of near-term, particularly one-year ahead, cash flow.

The results for the ordered measures, reported in Table 5, Panel B, provide evidence that there may still be a difference for the two-year time frame. The accrual index and the incremental improvement in the prediction of the two-year ahead cash flows is significantly negatively correlated ($p<0.008$) and it is not significant at

conventional levels (p<0.070) for the prediction of three-year ahead cash flows. As with the one-year ahead results, for the two-year ahead cash flow prediction, the relationship appears to be driven primarily by the long-term accruals, since the correlation between the accrual index and the incremental improvement due to the long-term accruals is significant (p<0.014). This relationship is no longer significant for the three-year ahead cash flows (p<0.136). These results indicate that the relationship between the accrual index and the incremental information provided by the accruals continues to be significant for the prediction of two-year ahead cash flows, but is diminished by the three-year ahead time frame.

The correlations of the incremental improvement with shareholders' rights and with the uncertainly avoidance index are also significant for the two-year ahead cash flows (again, due to the long-term accruals), but for them all of the correlations are insignificant for the three-year ahead prediction of cash flows.

Table 4: Comparison of Cash Flow Prediction Model Performance by Country for Two Period Ahead (CF_{t+1}) and Three Period Ahead (CF_{t+2}) Forecasts*

CASH Model: $CF_{i,t+j} = \alpha_0 + \alpha_1 CF_{i,t-1} + e_{it}\ (j = 1, 2)$

FULL Model: $CF_{i,t+j} = \beta_0 + \beta_1 CF_{i,t-1} + \beta_2 \Delta AR_{i,t-1} + \beta_3 \Delta AP_{i,t-1} + \beta_4 \Delta INV_{i,t-1} + \beta_5 CURO_{i,t-1} + \beta_6 DEPR_{i,t-1} + \beta_7 LTO_{i,t-1} + \varepsilon_{it}\ (j = 1, 2)$

CURR Model: $CF_{i,t+j} = \gamma_0 + \gamma_1 CF_{i,t-1} + \gamma_2 \Delta AR_{i,t-1} + \gamma_3 \Delta AP_{i,t-1} + \gamma_4 \Delta INV_{i,t-1} + \gamma_5 CURO_{i,t-1} + \upsilon_{it}\ (j = 1, 2)$

Panel A: CF_{t+1}

Country	N	R^2 [CASH]	R^2 [FULL]	R^2 [CURR]	Incremental Contribution of All Accruals R^2 Increase: R^2[FULL] - R^2[CASH]	Incremental Contribution of Noncurrent Accruals R^2 Increase: R^2[FULL] - R^2[CURR]
Switzerland	331	.152	.268	.223	.116	.044
Germany	482	.142	.261	.163	.118	.098
Japan	557	.276	.416	.332	.140	.084
France	384	.135	.194	.153	.059	.040
Netherlands	338	.193	.254	.224	.061	.030 *
Australia	463	.254	.304	.262	.050	.042
Canada	973	.246	.318	.284	.072	.034
UK	2,640	.212	.270	.233	.058	.036
US	11,008	.338	.377	.363	.039	.014

Panel B: CF_{t+2}

Country	N	R^2 [CASH]	R^2 [FULL]	R^2 [CURR]	Incremental Contribution of All Accruals R^2 Increase: R^2[FULL] - R^2[CASH]	Incremental Contribution of Noncurrent Accruals R^2 Increase: R^2[FULL] - R^2[CURR]
Switzerland	331	.130	.225	.185	.095	.039
Germany	482	.155	.222	.164	.067	.057
Japan	557	.230	.354	.275	.124	.079
France	384	.148	.183	.170	.035*	.014*
Netherlands	338	.146	.167	.159	.021 ns	.009 ns
Australia	463	.351	.370	.364	.020*	.006 ns
Canada	973	.210	.280	.230	.071	.050
UK	2,640	.164	.195	.174	.031	.021
US	11,008	.286	.316	.307	.030	.009

All significant at p < 0.01, except * = significant p < 0.05 and ns = not significant.

Thus, for the prediction of cash flows beyond the one-year (two-year) ahead time frame, the differences in the contributions provided by the accruals of code versus common-law countries (of countries with different levels of accruals, shareholders' rights or uncertainty avoidance), becomes less and less apparent. This is consistent with the concept that reported earnings information in the code-law countries (or countries with lower levels of accruals, lower levels of shareholders' rights or higher uncertainty avoidance) has near-term cash flow prediction advantages due to including less information that has implications for cash flows occurring further in the future.

Table 5: Correlations of the Cash Flow Prediction Model Performance and the Country-Specific Characteristics for Two Period Ahead (CF_{t+1}) and Three Period Ahead (CF_{t+2}) Forecasts

CASH Model: $CF_{i,t+j} = \alpha_0 + \alpha_1 CF_{i,t-1} + e_{it}$ $(j = 1, 2)$

FULL Model: $CF_{i,t+j} = \beta_0 + \beta_1 CF_{i,t-1} + \beta_2 \Delta AR_{i,t-1} + \beta_3 \Delta AP_{i,t-1} + \beta_4 \Delta INV_{i,t-1} + \beta_5 CURO_{i,t-1} + \beta_6 DEPR_{i,t-1} + \beta_7 LTO_{i,t-1} + \varepsilon_{it}$ $(j = 1, 2)$

CURR Model: $CF_{i,t+j} = \gamma_0 + \gamma_1 CF_{i,t-1} + \gamma_2 \Delta AR_{i,t-1} + \gamma_3 \Delta AP_{i,t-1} + \gamma_4 \Delta INV_{i,t-1} + \gamma_5 CURO_{i,t-1} + \upsilon_{it}$ $(j = 1, 2)$

Panel A: Mann-Whitney U Tests of the R^2 Results for Common/Code Countries

CF_{t+1}	R^2 [CASH]	R^2 [FULL]	R^2 [CURR]	R^2 Increase: R^2[FULL] - R^2[CASH]	R^2 Increase: R^2[FULL] - R^2[CURR]
Means					
Common Law (n = 4)	.263	.317	.286	.055	.032
Code Law (n = 5)	.179	.278	.219	.099	.059
Mean Rank (ranks 1 to 9)					
Common Law (n = 4)	6.75	6.50	6.75	3.00	3.50
Code Law (n = 5)	3.60	3.80	3.60	6.60	6.20
Mann-Whitney U	3.000	4.000	3.000	2.000	4.000
Exact Sig. (2-tailed)	.111	.190	.111	.063	.190

CF_{t+2}	R^2 [CASH]	R^2 [FULL]	R^2 [CURR]	R^2 Increase: R^2[FULL] - R^2[CASH]	R^2 Increase: R^2[FULL] - R^2[CURR]
Means					
Common Law (n = 4)	.253	.290	.269	.038	.032
Code Law (n = 5)	.162	.230	.191	.068	.040
Mean Rank (ranks 1 to 9)					
Common Law (n = 4)	7.00	6.25	6.75	3.75	4.00
Code Law (n = 5)	3.40	4.00	3.60	6.00	5.80
Mann-Whitney U	2.000	5.000	3.000	5.000	6.000
Exact Sig. (2-tailed)	.063	.286	.111	.286	.413

Table 5: Correlations of the Cash Flow Prediction Model Performance and the Country-Specific Characteristics for Two Period Ahead (CF_{t+1}) and Three Period Ahead (CF_{t+2}) Forecasts

Panel B: Spearman Correlations between the R^2 Results & the Ordered Measures

CF_{t+1} Characteristic	R^2 [CASH]	R^2 [FULL]	R^2 [CURR]	R^2 Increase: R^2[FULL] - R^2[CASH]	R^2 Increase: R^2[FULL] - R^2[CURR]
Accrual index	.627	.407	.627	-.814	-.780
(two-tailed p-value)	(.070)	(.278)	(.070)	(.008)	(.014)
Shareholder rights index	.795	.616	.795	-.710	-.701
(two-tailed p-value)	(.010)	(.078)	(.010)	(.032)	(.036)
Uncertainty avoidance	-.400	-.250	-.417	.700	.683
(two-tailed p-value)	(.286)	(.516)	(.264)	(.036)	(.042)

CF_{t+2} Characteristic	R^2 [CASH]	R^2 [FULL]	R^2 [CURR]	R^2 Increase: R^2[FULL] - R^2[CASH]	R^2 Increase: R^2[FULL] - R^2[CURR]
Accrual index	.661	.237	.458	-.627	-.542
(two-tailed p-value)	(.052)	(.538)	(.216)	(.070)	(.136)
Shareholder rights index	.752	.410	.607	-.487	-.419
(two-tailed p-value)	(.020)	(.276)	(.084)	(.184)	(.262)
Uncertainty avoidance	-.317	-.050	-.250	.517	.433
(two-tailed p-value)	(.406)	(.900)	(.516)	(.154)	(.244)

CONCLUSIONS

The results of this study integrate and extend important aspects of Ball et al. (2000), Hung (2001), and Barth et al. (2001). We have demonstrated that the timeliness of accrual accounting in common-law countries, shown by Ball et al., results in accruals having less incremental explanatory power over current cash flows alone in predicting next year's cash flows in common-law countries when compared to code-law countries and that these differences are located in the longer term accruals. Building on the common/code-law dichotomy, we have investigated the connection between an ordered accrual index measure for an accounting regime with the contribution of its accruals in explaining next year's cash flows, and we have documented that there is an inverse relationship.

These findings provide evidence of an interesting tradeoff in the relevance of accounting numbers for different purposes. The earnings from longer horizon, common-law jurisdictions have been found by prior research to have more value relevance. However, when used for short-term predictions like next year's cash flows, earnings components generated by shorter horizon, code-law regimes provide more incremental explanatory power. Accounting standards that incorporate the higher levels of accruals demand more estimates of future events and probable future costs than those with less rigorous accrual requirements. Although the estimated liabilities and related expenses (or assets and related revenues) may be theoretically sound, they increase the complexity of financial statements. There is a possible downside to an emphasis on accruing as much information as possible. The more complex the statements and the less confidence a user can have in the certainty of reported amounts, the more difficult it may be to use the information. The financial statements of companies in countries that do not demand as high a level of accruals may provide information that the public can use more easily for some purposes—as in this study, using the components of reported earnings to forecast the following year's operating cash flows. Assessing liquidity may be relatively more important in bank-based economies than assessing total firm value. In addition, there may be practical reasons in any economy for needing information about near-term cash flows. Suppliers and others extending short-term credit, for instance, are particularly interested in knowing what a

company's cash situation will be during the upcoming months. The increasing availability of analysts' forecasts of operating cash flows is evidence of the public's desire for this information, even in market-based economies. Our findings raise the issue of a potential conflict between accrual aggressiveness and some purposes for which the accounting information may be used, so this tradeoff should be recognized.

In addition to these two primary characteristics, we tested two other measures, protection of shareholders' rights and uncertainty avoidance. Protection of shareholders' rights is negatively related, and uncertainty avoidance is positively related, to the explanatory power of adding accruals to operating cash flows. The three ordered characteristics are highly correlated, however, the structural relationship among these variables is unclear at this point. Whether the significant results are due to aspects of all three measures, or only one of them, is impossible to say. Yet, all are representative of key aspects of the accounting environments of countries in the study and may have had an influence on the evolution of the accounting standards or on the manner in which accounting is practiced.

By construction, the accrual index is a measure of the extent that accruals are incorporated in a national accounting system. The larger the accrual index, the more likely the accounting system of the country has a longer accrual horizon. On the other hand, Hofstede's uncertainty avoidance is a totally different type of construct. As a measure of how people function within a culture, including it in this study helps us to remain cognizant that accounting systems are created and implemented by human beings and human behavioral aspects of culture can play a decisive role. Those who put the numbers together in the different countries may have been more or less motivated to avoid uncertain outcomes or ambiguous situations. Clearly, the endogenous dynamics among uncertainty avoidance, shareholder protection, common or code-law heritage, and the accrual horizon provides a challenging field for further investigation.

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